DOCUMENT RESUME

ED 329 703 CE 057 113

AUTHOR Letlow, Richard M.; Verma, Satish
TITLE Production Practices of Commercial Catfish Producers in Northeast Louisiana.
PUB DATE Sep 90
NOTE 13p.; Paper presented at the Annual Conference of the Association of Louisiana Evaluators (1st, New Orleans, LA, September 14-15, 1990).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Education; *Agricultural Production; Diseases; Extension Agents; Extension Education; *Farmers; Farm Management; *Fisheries; Harvesting; *Ichthyology; *Production Techniques; Records Management; Water Quality
IDENTIFIERS *Catfish Farming; *Louisiana; Louisiana Cooperative Extension Service

ABSTRACT

A study determined the yields obtained and the production practices followed by Louisiana commercial catfish farmers in Catahoula, Concordia, and Franklin Parishes. This information was used by the Louisiana Cooperative Extension Service (LCES) faculty to develop a catfish education program. The study: (1) determined use of selected recommended catfish production practices and relationship with yield; (2) studied the relationships between yield and production practices with certain personal and farming characteristics and extension contacts; and (3) identified problems experienced by catfish farmers. From the 100 commercial catfish producers in the three-parish area who marketed catfish in the 1988 season, a proportional stratified random sample of 51 was drawn. Data were collected by personal interview. A production practices score was developed for each farmer based on whether or not the 14 recommended production practices were being followed. The practices were grouped under six major production categories: stocking; feeding; water quality management; disease; harvesting; and records. None of the relationships were statistically significant. It was recommended that extension education programs for catfish farmers should focus on major problems experienced by farmers including bird predation, off-flavor in fish, marketing, fish diseases, and financing. Educational activities should be continued as a part of the LCES information delivery system. (Three tables and five references are included.) (NLA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

CE

ED329703

PRODUCTION PRACTICES OF COMMERCIAL CATFISH PRODUCERS IN NORTHEAST LOUISIANA

Richard M. Letlow
Associate County Agent

and

Satish Verma
Specialist and Coordinator
(Program and Staff Development) and
Professor of Extension Education

Louisiana Cooperative Extension Service
University Station
Baton Rouge, Louisiana

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

R Letlow

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Paper presented at the 1st Annual Conference of the Association of Louisiana Evaluators, New Orleans, Louisiana, September 14-15, 1990.

BEST COPY AVAILABLE

THE CATFISH INDUSTRY IN LOUISIANA

Catfish is a fast-growing commercial enterprise primarily in the south central United States. In 1988, Louisiana had 10,500 acres of commercial catfish ponds, compared with only 1,000 acres in 1984. Over three-fourths of this acreage (7,920 acres) is to be found in the northeast parishes (counties) of Catahoula, Concordia and Franklin, and the remaining one-fourth among 31 parishes. The farm value of catfish in the three-parish area adds up to $20.3 million. Three catfish processing plants are located in the area.

The channel catfish (*Ictalarus punctatus*) is well-suited to commercial production. Because it does not reproduce in cultured ponds the population can be controlled. Catfish is easy to spawn, tolerates crowding, adapts to cultured systems and survives in a wide range of environments. However, commercial production requires suitable land for pond construction, an adequate supply of water, capital for facility construction and fish production, a dependable market, good management skills and substantial time commitment (Jensen, 1988).

Commercial catfish production is an economically attractive alternative enterprise to traditional row crop agronomic crops such as sugarcane and rice. Catfish has a mild flavor which is well-liked. The flesh retains its high quality after a variety of processing (Tucker, 1985). Besides commercial production, some of the catfish acreage in Louisiana is designated for fee fishing, wherein fishermen are charged a fee and an amount proportional to the quantity of catch and purchase.

SCIENTIFIC CATFISH PRODUCTION

The Louisiana Cooperative Extension Service (LCES) which is the informal educational arm of Louisiana State University and Agricultural and Mechanical College has been promoting the development of the catfish industry over the last five years by dedicating additional faculty resources and technical assistance in production, harvesting and marketing. Teaching methods used to reach catfish farmers include group workshops and seminars, high-intensity personal contacts with individual farmers, and publications.

In general, Extension recommendations are based on location-specific research findings. With regard to catfish, however, research under Louisiana conditions is lacking, and LCES recommendations come from research in Alabama, Arkansas and Mississippi, and/or the experiences of farmers and professional extension faculty who have been working with the industry. Furthermore, little is known about the acceptance of these recommendations by Louisiana catfish farmers.

Given this situation, it was felt that a study of catfish production practices and problems of Louisiana catfish farmers and their relationship with the LCES would be useful to research and extension faculty in the university system. The study was confined to the three-parish area of Northeast Louisiana which has three-fourths of the catfish acreage in the state.

Fourteen recommended catfish production practices were selected for study because of their importance in proper enterprise management, yield and profit. These were grouped under six major production categories, stocking, feeding, water quality management, disease, harvesting, and records. The specific recommendation for each practice is described below.

Stocking Practices

Most catfish producers stock their ponds with fingerlings purchased from hatcheries.

Stocking rate. This depends on a number of factors - size of pond, producer experience, length of growing season, market size desired, water supply, feeding and food consumption rates. The recommendation is for new catfish producers to stock 4,000-4,500 fingerlings per acre, and experienced producers 6,000 fingerlings per acre.

Laboratory check. It is recommended that purchased fingerlings be checked by a diagnostic laboratory before buying and actual stocking.

When to restock. Once a pond is established, restocking should be done after harvest.

Feeding Practices

Amount of feed. The recommendation is to feed not more than 100 lb/day.

Determining amount to feed. Fish should not be overfed because of waste and possible water quality problems. Optimum feeding is achieved when the feed is consumed within five to ten minutes. The Alabama Cooperative Extension Service (1986) recommends taking a seine sample to calculate the total initial weight of fish and feeding approximately three percent of that weight for two-week periods. Every two weeks, the weight gain is estimated and the ration adjusted.

Winter feeding. Growth of catfish slows down during the winter. Feed digestion rate and appetite decrease as the temperature decreases. Jensen (1988) recommends feeding when the water temperature is above 45-50 degrees Fahrenheit and using sinking feed to allow slower moving fish to forage along the bottom of the pond.

Water Quality Management

Maintaining good water quality in production ponds is absolutely essential. Failure to do so results in poor growth and high feed conversion at best, or total loss at worst (Wellborn, 1985).

Dissolved oxygen is the most important factor to understand and manage. The primary source of dissolved oxygen is photosynthesis (during the day) by aquatic plants. These same plants consume oxygen at night. Oxygen depletion can occur if more oxygen

is removed than is produced. The following practices are recommended to ensure oxygen sufficiency:

1. There should be at least one fixed mechanical aerator per pond and one portable aerator for four ponds.

2. Fixed aerators should have a capacity of at least one horsepower per acre of water.

3. Aerators should be started when the dissolved oxygen level is four parts per million (ppm) and shows signs of dropping.

4. Dissolved oxygen levels should be checked daily using an oxygen testing meter, and other water quality factors weekly.

Diseases

The first indication that fish may be diseased is reduced feeding activity. A qualified fish health specialist and/or a diagnostic laboratory should be consulted if any abnormal behavior, visible signs or fish losses are suspected to be disease-related.

Harvesting

Catfish should be harvested and delivered alive and free of abrasions or bruises to processing plants/fresh market outlets.

There are two ways of harvesting: raising fish for the entire season and harvesting at one time; "topping" or partially harvesting market size fish three to four times a year and replacing the harvested fish with fingerlings. The latter is the preferred practice.

Records

A successful catfish farmer must know the number and weight of fish in every pond at any given time. It is recommended that records of water quality and feeding rate be kept for each pond, along with fish inventories, expenses and general working operations.

PURPOSE OF STUDY

The primary purpose of the study was to determine the yields obtained and the production practices followed by commercial catfish farmers in Catahoula, Concordia and Franklin parishes and make comparisons with their personal and farming characteristics, and Extension contacts. This information could then be used by Extension faculty to develop a catfish extension education program.

OBJECTIVES OF STUDY

1. To determine use of selected recommended catfish production practices, and relationship with yield.

2. To study the relationships between yield and production practices with certain personal and farming characteristics, and Extension contacts.

3. To identify problems experienced by catfish farmers.

LIMITATIONS OF STUDY

1. Unlike actual acreages of agronomic crops such as cotton, soybeans and rice which have to be accurately reported to the Parish Agricultural Stabilization and Conservation Service, catfish acreage figures are estimates by farmers.

2. There are no independent lists of catfish farmers in the study parishes. The lists used comprised farmers who had attended at least one catfish extension education program of the LCES in the preceding four years.

3. Catfish production recommendations made by the LCES are based on out-of-state research findings.

4. Catfish yields are those reported by farmers, and thus could be estimates.

METHODOLOGY

Sample

There were 100 commercial catfish producers in the three-parish area who marketed catfish in the 1988 season. According to Cochran's formula, the minimum sample size for 100 producers at the .05 level of risk and .10 margin of error is 49 (Davis, 1971). A proportional stratified random sample of 51 catfish producers was drawn.

Instrumentation

The survey instrument was composed of questions covering the selected production practices, personal and farming characteristics, and association with and perception of catfish extension education programs. Assistance was obtained from catfish specialists in the LCES and reported research. The instrument was reviewed for content validity by the LCES catfish specialist. Thereafter, it was pretested with six catfish producers for face validity.

Data Collection

Data were collected by personal interview. Appointments were made with sample farmers and they were interviewed on their farms. Interviews were conducted between August-September 1989.

Analysis of Data

A production practices score was developed for each farmer based on whether or not the 14 recommended production practices were being followed. Differential weights were assigned to these practices by a panel of research and extension faculty based on relative contribution of each practice to catfish yield. Table 1 shows the values given if farmers followed the practices. A value of zero was given if they did not.

RESULTS

Adoption of Recommended Practices

Stocking practices. All respondents were considered experienced producers as they had farmed one year or more. Twenty-two percent stocked at the recommended rate of 6,000 fingerlings or more per acre, the remaining 78 percent below the recommendation.

Only 14 percent had fingerlings checked by a diagnostic laboratory before purchase.

Thirty-nine percent harvested ponds partially and restocked as recommended.

Feeding practices.

Forty-three percent fed the recommended amount of less than 100 lb/day.

Only six percent took a seine sample every two weeks to calculate feed amounts. The remaining 94 percent fed all fish would eat, or used other methods such as guessing, and a mark on the feeder.

Seventy-three percent fed catfish in winter on the basis of recommended water temperature.

Water quality management. Mechanical aerators are used to replenish dissolved oxygen in catfish ponds, which is essential for the growth, health and life of catfish.

The average number of fixed mechanical aerators per producer was 7.7, while the average number of ponds was 10.1. The recommendation is one fixed aerator per pond. Seventy-one percent were following the recommendation, the remaining were deficient in this regard.

The average horsepower of fixed aerators was .86/acre, slightly less than the recommended one horsepower.

Seventy-three percent of the producers began operating their aerators when the dissolved oxygen level was four ppm, as recommended. The remaining 27 percent started aerators at three ppm or lower.

Table 1. Weighting System for Recommended Production Practices

Recommended Practices	Weight Assigned if Following Practice[a]
Water Quality Management	
At least one fixed aerator per pond	4
1 hp fixed aerator per acre	4
Start aerators at 4 ppm dissolved oxygen	4
Test oxygen daily	4
sub-total	16
Stocking	
New pond (4,500 lbs/acre)	4
Pond in production (6,000 lbs/acre)	4
Stock checked by laboratory before purchase/stocking	2
Fingerlings are stocked after harvest (partial)	3
sub-total	13
Feeding	
Amount feed given (100 lbs/day)	3
Using a seine sample to determine amount to feed	3
Feed fish in winter based on water temperature	3
sub-total	9
Disease	
Use LSU laboratory or consultant for diagnosis	3
Records	
Records kept	2
Harvesting	
Partial harvest fish, then restock	1
Grand Total	44

[a] Value of 0 if not following practice.

Seventy-one percent checked temperature (and dissolved oxygen) daily, and 50 percent checked for other water quality factors weekly.

Diagnosing diseases. Sixty-three percent of the producers used the Louisiana State University laboratory or a health consultant to diagnose diseases. The rest did it on their own.

Harvesting. Only 39 percent of the farmers followed the recommendation to restock ponds after harvest.

Records. Forty-nine percent kept water quality records and 29 percent feeding records. Only 14 percent kept records of the number of hours ponds were aerated in a day. Operating and yield records were kept by 90 and 71 percent, respectively.

Relationship of Production Practices with Yield

The adoption of the above practices was summarized in a production practices score as described in the methodology section.

Of a possible production practices score of 44, the range of obtained scores was 7.8 to 33.8, with a mean of 20.4.

Means for practice categories are shown in Table 2. In all cases, except stocking, the mean was about one-half the possible score. For stocking, the mean was about a third.

Catfish yield ranged from 2,000 to 8,000 pounds per acre. The mean yield was 4,300 pounds.

The correlation between production practices score and yield was statistically non-significant ($r = .09$, $P = .53$).

Relationship between Production Practices, Yield and Selected Factors

There was no relationship between years producers had been farming catfish, percent of their income derived from catfish, pond acreage and their age, and either production practices score or yield, as shown by the low correlation coefficients.

Highest level of education also was unrelated to the production practices score and yield, as shown by the analysis of variance procedure.

Using the LCES as a major source of information appeared to have a salutary influence on adoption of recommended practices. The mean production practices score for users, who made up 78 percent of the sample, was higher (20.9) than for non-users (17.8). However, this was not statistically significant at the .05 level. No difference in yield was observed between users and non-users.

Table 2. Mean Scores of Categories of the Production Practices Score

Component	No. of Practices	Possible Score	Mean Score
Water quality management	4	16	7.72
Stocking	4	13	4.35
Feeding	3	9	4.82
Disease control	1	3	1.71
Record keeping	1	2	.88
Harvesting	1	1	.90

Respondents gave high marks to the LCES for its educational programs. Over 90 percent indicated that workshops, tours and field days they had attended were very or somewhat informative. Personal visits and telephone contacts were also very beneficial, as was catfish information contained in periodic newsletters.

Production Problems Faced by Catfish Farmers

Catfish farmers were asked to rate the severity of production problems on their farms on a five-point scale, one being no problem, five being a very serious problem. Table 3 shows mean ratings of the several problems and percentages of producers rating them as very serious.

The top five problems were aquatic birds, off-flavor in fish, marketing, farm financing and fish diseases.

The least significant problems were availability of chemicals and information, technical assistance, record keeping and harvesting.

Table 3. Rating of Production Problems

Problem	Mean Rating Score[a]	% Producers Rating Problem Very Serious
Aquatic birds	3.92	57
Off-flavor in fish	3.18	22
Marketing	2.76	20
Farm financing	2.65	14
Fish disease	2.53	16
Aquatic weeds	2.13	8
Water quality	1.94	6
Oxygen levels	1.92	0
Labor	1.59	4
Harvesting	1.47	0
Record keeping	1.43	0
Available information	1.33	2
Technical assistance	1.33	0
Availability of chemicals	1.24	0

[a] 5 = very serious problem
1 = no problem

CONCLUSIONS

Catfish acreage in Louisiana has increased annually from 1,000 acres in 1984 to 10,500 acres in 1988. As long as the catfish marketing situation remains favorable and lending institutions support the enterprise with production loans, the acreage should continue to increase.

If the LCES is to meet the needs of the catfish industry, more production-type research should be conducted under Louisiana conditions. For example, research is needed on the proper amounts of feed during different growth stages. The present recommendation is to feed as much as catfish can eat in five to ten minutes. This is not an accurate measure and could lead to problems in other aspects of production. Water quality management parameters for Louisiana should also be strenuously researched since these are critical to production.

None of the relationships between production practices and yield, and these production variables and selected personal and farming characteristics, and contacts with LCES were statistically significant. That a significant relationship did not exist between adoption of production practices and yield, as might be expected, could be explained by the influence of factors not considered in the study, such as level of inputs, financial constraints, climate, level of management ability, etc. That relationships between production variables and other factors were not found could be due to social and cultural homogeneity of rural populations, wherein technology adoption is often from friends and neighbors.

Extension education programs for catfish farmers should focus on major problems experienced by farmers. These include bird predation, off-flavor in fish, marketing, fish diseases and financing.

Extension education programs should also focus on production practices showing lower levels of adoption. Specifically, these practices are optimum stocking rate, having fingerlings checked by a laboratory before purchase, calculating amount of feed with a seine sample, restocking after and not before harvest, and maintaining water quality and feeding records.

Workshops, educational tours, direct mail, personal visits should be continued as a part of the LCES information delivery system. Radio and television broadcasts as well as features and articles in newspapers and farm-related publications would supplement this effort. Lending institutions should be included in LCES's educational programs so as to enlist their financial support for the catfish industry.

The LCES has established an excellent working relationship with catfish farmers. It will likely continue to be a major source of influence in the further development of the industry.

REFERENCES CITED

Alabama Cooperative Extension Service (1986). Channel Catfish Production in Ponds. Auburn University, Auburn, Alabama.

Davis, J.A. (1971). Elementary Survey Analysis. Englewood Cliffs, New Jersey, Prentice Hall.

Jensen, Gary L. (1988). Commercial Production of Farm-Raised Catfish. Baton Rouge: Agricultural Experiment Station and Cooperative Extension Service, Louisiana State University.

Tucker, C.S. (1985). Channel Catfish Culture. New York: Elsevier Science Publishing Company, New York.

Wellborn, Thomas L., Jr. (1985). New Catfish Farmers Handbook. Starkville, Mississippi: Mississippi Cooperative Extension Service, Mississippi State University.